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10/643,015	08/18/2003	Todd S. Emrick	7163	2962

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EXAMINER

FEELY, MICHAEL J

ART UNIT

PAPER NUMBER

1712

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/643,015

Applicant(s)

EMRICK ET AL.

Examiner

Michael J Feely

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-12 is/are allowed.
- 6) ☒ Claim(s) 1-4, 13-15, 18 and 20-23 is/are rejected.
- 7) ☒ Claim(s) 5, 16, 17, 19 and 24-26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites the limitation "a co-polymeric component" in the ligand component of claim 11. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language;

or

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1-4, 14, 15, 18, and 20-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Dubertret et al. (Pub. No.: US 2004/0033345).

Regarding claims 1-4, Dubertret et al. disclose **(1)** a composite (paragraph 0017) comprising a metallic nanoparticulate substrate component (paragraphs 0018-0022) and a polymeric ligand component (paragraphs 0034-0037), said ligand component comprising a nitrogenous coupling moiety (paragraphs 0051, 0056-0057, and 0066-0067); **(2)** wherein said substrate comprises a nanoparticle selected from CdSe, CdS, CdTe, ZnS, ZnSe, Co and combinations thereof (paragraphs 0018-0022); **(3)** wherein said nitrogenous moiety is selected from amino, pyridinyl and aminopyridinyl moieties (paragraphs 0056-0057 and 0066-0067); and **(4)** wherein said polymeric ligand component is selected from poly(ethylene glycol), poly(hexaethylene glycol), poly(hexadecylethylene glycol), poly( $\epsilon$ -caprolactone), poly(lactide), poly(glycolide), polyglydicyl, polypropylene oxide and combinations thereof (paragraphs 0051, 0056-0057, and 0066-0067).

Regarding claims 14, 15, and 18, Dubertret et al. disclose **(14)** a system for nanoparticle dispersion, said system comprising: a composite comprising a nanoparticulate substrate (paragraphs 0018-0022) and a first ligand component, said composite in a first liquid medium

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(paragraphs 0032-0033); and a second ligand component in a second liquid medium, said second ligand component at least partially soluble in said second liquid medium (paragraphs 0034-0037) and selected from poly(ethylene glycol), poly(hexaethylene glycol), poly(hexadecylethylene glycol), poly(e-caprolactone), poly(lactide), poly(glycolide), polyglydicyl, polypropylene oxide and combinations thereof (paragraphs 0051, 0056-0057, and 0066-0067); **(15)** wherein said second ligand component has an affinity for said nanoparticulate substrate greater than said first ligand component (paragraphs 0032-0037, 0051, 0056-0057, and 0066-0067); and **(18)** wherein said nanoparticulate substrate comprises CdSe (paragraph 0021) and said second ligand component has an affinity for said nanoparticulate substrate greater than said first ligand component (paragraphs 0032-0037, 0051, 0056-0057, and 0066-0067).

Regarding claims 20-23, Dubertret et al. disclose **(20)** a method of using ligand solubility to disperse a nanoparticulate substrate (paragraphs 0010-0012 and 0017), said method comprising providing a composite comprising a nanoparticulate substrate (paragraphs 0018-0022) and a first ligand component (paragraphs 0032-0033); and contacting said composite with a second ligand component, said second ligand component in a second liquid medium, said second ligand component at least partially soluble in said second liquid medium (paragraphs 0034-0037), said contact with said second ligand component dispersing said nanoparticulate substrate in said medium (paragraphs 0010-0012 and 0017 and 0034-0037); **(21)** wherein said substrate comprises a nanoparticle selected from CdSe, CdS, CdTe, ZnS, ZnSe, Co and combinations thereof (paragraphs 0018-0022); **(22)** wherein said polymeric ligand component is selected from poly(ethylene glycol), poly(hexaethylene glycol), poly(hexadecylethylene glycol), poly(e-caprolactone), poly(lactide), poly(glycolide), polyglydicyl, polypropylene oxide and

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combinations thereof (paragraphs 0051, 0056-0057, and 0066-0067); and (23) wherein said polymeric ligand component comprises poly(ethylene glycol) (paragraphs 0056-0057, and 0066-0067).

***Allowable Subject Matter***

5. Claims 6-12 are allowed.
6. Claim 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
7. Claims 5, 16, 17, 19, and 24-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. The following is a statement of reasons for the indication of allowable subject matter:  
*Regarding claim 5:* the closest prior art is Dubertret et al. They teach a ligand having a hydrophilic PEG moiety that is attached to a hydrophobic moiety, and said PEG moiety can be functionalized using moieties such as amino and hydroxy groups. However, there is no motivation in these teachings to use both amino groups and a terminal hydroxyl group.  
*Regarding claims 6 and 7-10:* the closest prior art is Dubertret et al. They disclose a similar nanoparticle; however, there is no teaching or suggestion of a ligand having a terminal pyridinyl or aminopyridinyl moiety. Claims 7 and 10 are allowable because they are dependent from claim 6.  
*Regarding claims 11 and 12-13:* the closest prior art is Dubertret et al.; however they fail to teach or suggest a PEG polymeric ligand having a pyridinyl terminal moiety and a second terminal

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selected from the group consisting of hydroxy, alkyl, alkoxy, carboxylate, thymine, ammonium salt, and substituted ammonium salt moieties. Claims 12 and 13 are allowable because they are dependent from claim 11.

*Regarding claim 16 and 17:* the closest prior art is Dubertret et al. They provide no motivation or suggestion to use a second ligand component terminated a pyridinyl moiety. Claim 17 is allowable because it is dependent from claim 16.

*Regarding claim 19:* the closest prior art is Dubertret et al. They provide no motivation to terminate their PEG ligand with a pyridinyl moiety.

*Regarding claims 24 and 25-26:* the closest prior art is Dubertret et al. They provide no motivation to use a second ligand terminated with a pyridinyl moiety. Claims 25 and 26 are allowable because they are dependent from claim 24.

### ***Communication***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 571-272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael J. Feely  
Patent Examiner  
Art Unit 1712

August 9, 2004